

CLAIM AMENDMENTS

1 1. (currently amended) A method for controlling input/output (I/O) operations of
2 a user's computer comprising the following steps:

3 implementing the user's computer as a virtual machine (VM);

4 including ~~a virtual machine monitor (VMM) as a VM transparent~~ an interface
5 software component between the VM and a physical computer system that includes at
6 least one device;

7 in the ~~VMM~~ interface software component:

8 sensing a request for an I/O operation between the VM and the device;

9 performing a transformation of I/O data passing between the VM and the device,
10 said transformation being adjunct to necessary completion of the request, as issued, for
11 the I/O operation;

12 the transformation of the I/O data thereby being undefeatable by any user action
13 via the VM.

1 2. (currently amended) A method as in claim 1, in which:

2 the device is a display;

3 the I/O data is VM display data output from the VM and intended for display; and

4 the transformation is a replacement of at least a portion of the VM display data
5 with non-defeatable display data stored external to the VM ~~but accessible to the VMM~~;

6 further including the step of displaying the VM display data with the non-
7 defeatable display data overlaid.

1 3. (previously presented) A method as in claim 1, further including the following
2 steps:

3 filtering the I/O data with respect to at least one predetermined filtering condition;

4 and

5 performing the transformation of the I/O data only when the filtering condition is
6 met.

1 4. (previously presented) A method as in claim 3, in which the filtering condition
2 is that the I/O data includes at least one restricted term.

1 5. (previously presented) A method as in claim 3, in which the filtering condition
2 is that the I/O data is from a restricted source.

1 6. (previously presented) A method as in claim 3, in which:
2 the I/O data includes image data;
3 the step of filtering the I/O data comprises detecting the presence of a
4 representation of a target image within the image data; and
5 the transformation is substitution of a representation of a replacement image in
6 place of the representation of the target image.

1 7. (original) A method as in claim 6, in which:
2 the I/O data is in a non-character image format;
3 the target image is a representation of a restricted character string; and
4 the step of filtering the I/O data comprises applying character recognition to the
5 I/O data.

1 8. (previously presented) A method as in claim 3, in which the filtering condition
2 is the presence in the I/O data of a copy protection indication.

1 9. (previously presented) A method as in claim 1, in which the transformation
2 comprises insertion into the I/O data of a source indication associated with the VM.

1 10. (original) A method as in claim 1, in which the transformation is time-
2 varying.

1 11. (original) A method as in claim 1, in which the device is a network
2 connection device.

1 12. (previously presented) A method as in claim 11, in which the transformation
2 is a bandwidth limiting of the I/O data being transferred between the VM and the
3 network connection device.

1 13. (previously presented) A method as in claim 11, in which:
2 the requested I/O operation is a transfer of the I/O data between the VM and the
3 network connection device; and
4 the transformation is a time delay of the transfer.

1 14. (previously presented) A method as in claim 11, in which:
2 the requested I/O operation is a transfer of the I/O data from the VM to a first
3 destination address via the network connection device;
4 the transformation is a redirection of the I/O data to a second destination address
5 different from the first.

1 15. (previously presented) A method as in claim 1, in which:
2 the device is a display;
3 the display renders data stored in a display map; and
4 the step of performing the transformation comprises altering a selected portion of the
5 display map.

1 16. (currently amended) A method as in claim 15, in which the step of altering
2 the selected portion of the display data comprises substituting [[,] non-defeatable
3 display data for the selected portion.

1 17. (previously presented) A method as in claim 15, in which the step of
2 altering the selected portion of the display data comprises changing all occurrences in
3 the display map of a display color to a replacement color.

1 18. (previously presented) A method as in claim 1, in which:
2 the device is a data storage device;
3 the requested I/O operation is a transfer of data between the VM and the storage
4 device; and
5 the step of performing the transformation comprises changing at least a portion
6 of the data during the transfer between the VM and the storage device.

1 19. (previously presented) A method as in claim 18, in which the step of
2 performing the transformation of the I/O data comprises encrypting data written by the
3 VM to the data storage device and decrypting data read from the data storage device by
4 the VM.

1 20. (previously presented) A method as in claim 18, in which the step of
2 performing the transformation of the I/O data comprises compressing data written by the
3 VM to the data storage device and decompressing data read from the data storage
4 device by the VM.

1 21. (previously presented) A method as in claim 1, in which:
2 the device is a network connection device;
3 the requested I/O operation is a transfer of data between the VM and the network
4 connection device; and
5 the step of performing the transformation comprises changing at least a portion
6 of the data during the transfer between the VM and the network connection device.

1 22. (previously presented) A method as in claim 21, in which the step of
2 performing the transformation of the I/O data comprises encrypting data written by the
3 VM to the network connection device and decrypting data read from the network
4 connection device by the VM.

1 23. (previously presented) A method as in claim 21, in which the step of
2 performing the transformation of the I/O data comprises compressing data written by the
3 VM to the network connection device and decompressing data read from the network
4 connection device by the VM.

1 24. (previously presented) A method as in claim 1, in which the step of
2 performing the transformation of the I/O data comprises cryptographic transformation of
3 the I/O data.

1 25. (previously presented) A method as in claim 3, in which:
2 the VM supports a plurality of I/O modes;
3 the step of filtering is performed on I/O data corresponding to a first one of the
4 plurality of I/O modes; and
5 the predetermined transformation is applied to I/O data in a second one of the I/O
6 modes when the I/O data in the first I/O mode satisfies a transformation-triggering
7 criterion.

1 26. (original) A method as in claim 25, in which the I/O modes include a video
2 mode and an audio mode.

1 27. (currently amended) A method for controlling input/output (I/O) of a user's
2 computer comprising the following steps:
3 implementing the user's computer as a virtual machine (VM);
4 including ~~a virtual machine monitor (VMM) as a VM-transparent~~ an interface
5 software component between the VM and a physical computer system that includes at
6 least one device that carries out an I/O operation on the basis of device control data;
7 storing the device control data associated with the VM in a buffer ~~in the VMM~~;
8 upon sensing a transformation command from an administrative system external
9 to the VM, entering replacement data into at least a portion of the buffer, said
10 replacement data being entered as a processing step that is adjunct to the necessary
11 completion of the I/O operation;
12 the entry of the replacement data thereby being undefeatable by any action
13 initiated via the VM.

1 28. (currently amended) A system for controlling input/output (I/O) operations of
2 a user's computer, comprising:
3 a virtual machine (VM) constituting the user's computer;
4 ~~a virtual machine monitor (VMM) forming a VM-transparent~~ an interface software
5 component between the VM and a physical computer system that includes at least one
6 device;
7 the ~~VMM~~ interface software component including ~~means~~ computer-executable
8 code:
9 for sensing a request for an I/O operation between the VM and the device;
10 and
11 for performing a transformation of I/O data passing between the VM and
12 the device, said transformation being adjunct to necessary completion of the request, as
13 issued, for the I/O operation;
14 the transformation of the I/O data thereby being undefeatable by any action via
15 the VM.

1 29. (original) A system as in claim 28, in which the device is a display and the
2 I/O data is VM display data.

1 30. (currently amended) A system as in claim 29, further comprising:
2 a display buffer ~~within the VMM~~ for storing the VM display data that is output from
3 the VM and is intended for display; and
4 a transformation means software module comprising computer-executable code
5 within the interface software component ~~located within the VMM~~ for replacing at least a
6 portion of the VM display data stored in the display buffer with non-defeatable display
7 data;
8 in which the display is provided for displaying the contents of the display buffer.

1 31. (original) A system as in claim 28, in which the device is a data storage
2 device.

1 32. (original) A system as in claim 28, in which the device is a network
2 connection device.